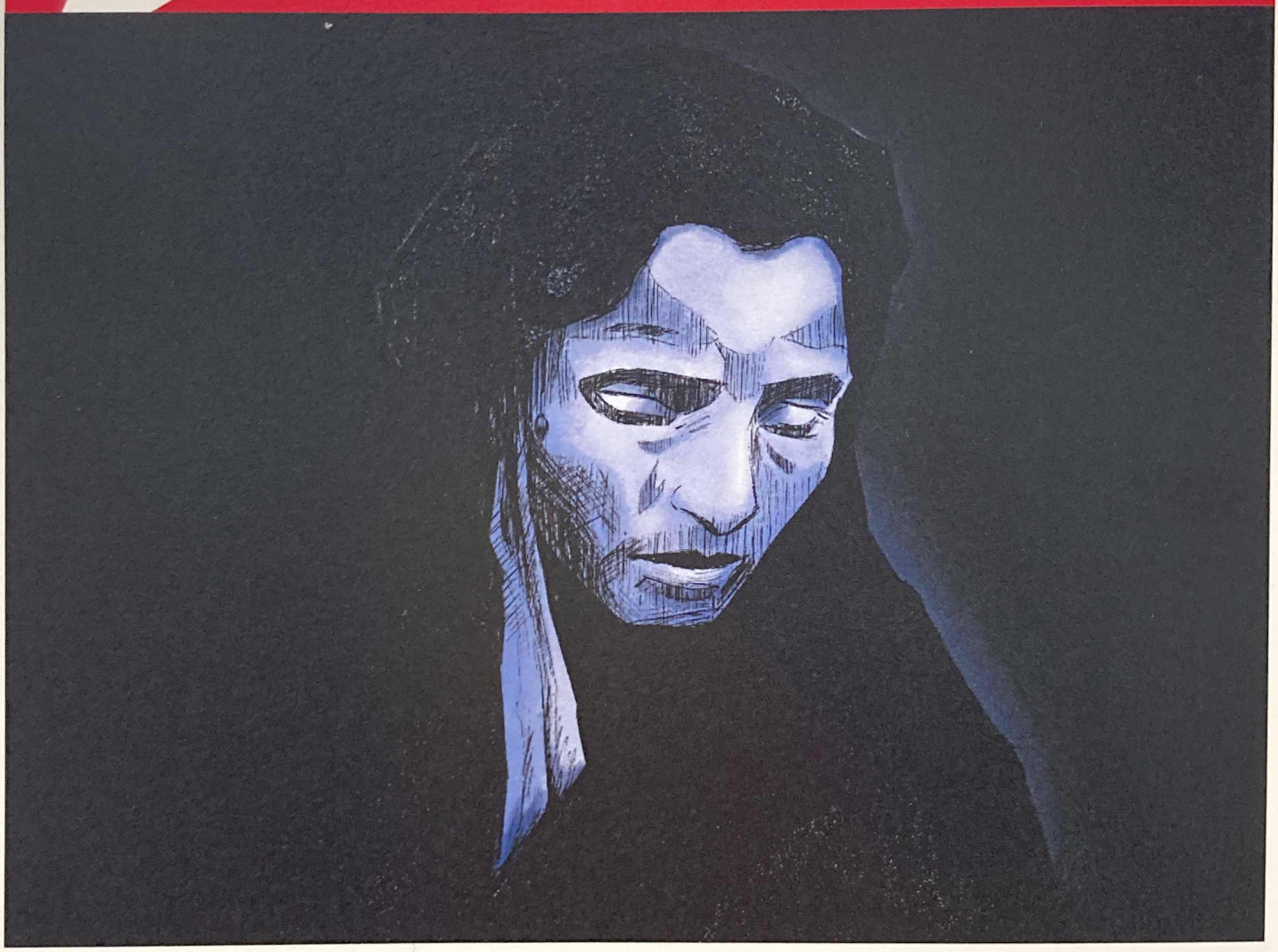
25

CELEBRATING 25 YEARS

2021 Benjamin
MENSCHEL
Fellowship
EXHIBITION



THE COOPER UNION FOR THE ADVANCEMENT OF SCIENCE AND ART

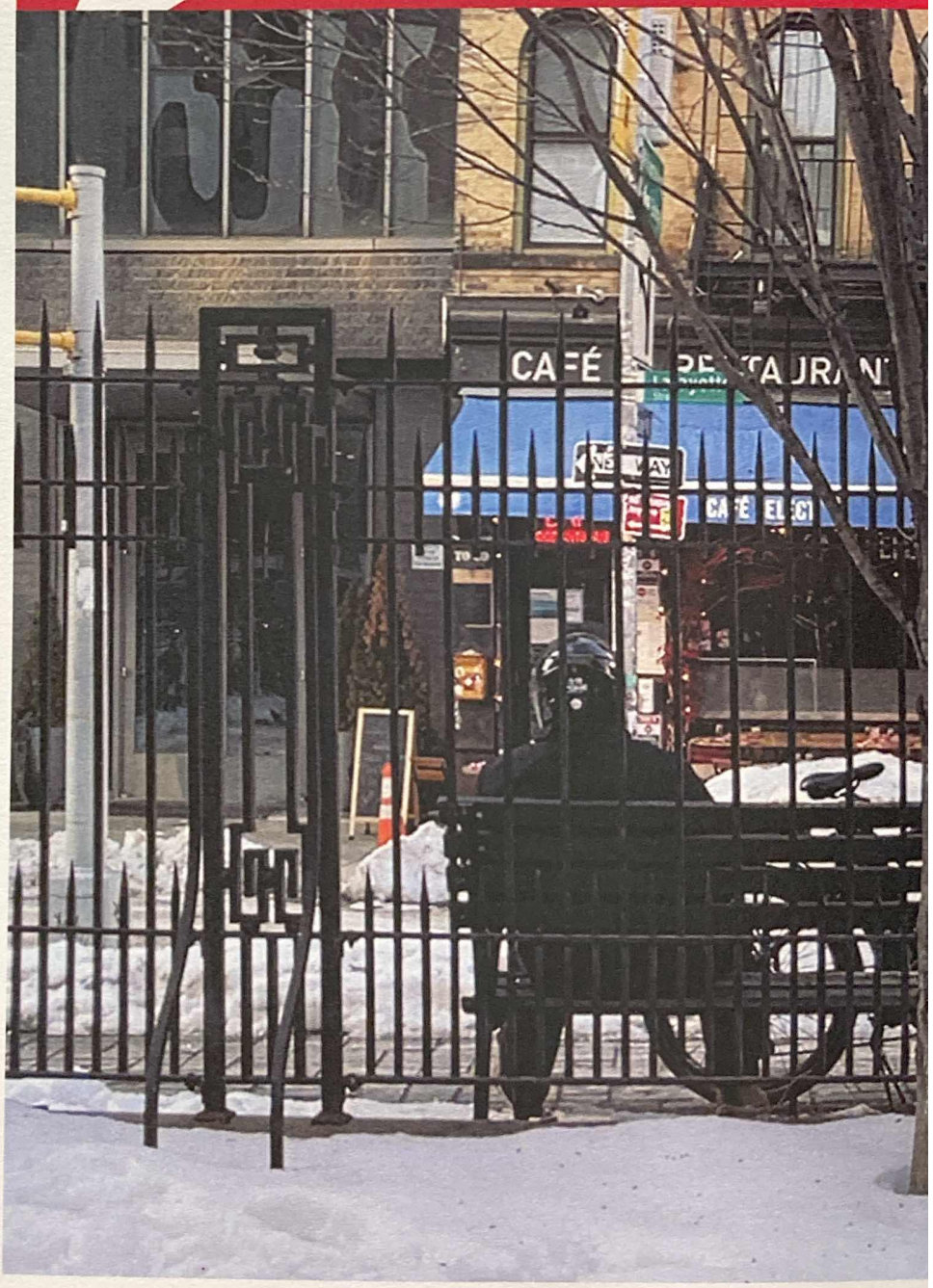
BRANDON BUNT ENGINEERING ELIAS DILLS ARCHITECTURE LIONEL GILLIAR-SCHOENENBERGER ENGINEERING
ANNABELLA CHEN ARCHITECTURE SCARLETT CHEN ARCHITECTURE AHZIN NAM ARCHITECTURE
KEVIN CHOW ARCHITECTURE CHAU-ANH NGUYEN ARCHITECTURE VIRGINIA REBOLI ART
KANIZ FATEMA ART
TALYA KRUPNICK ART

FEBRUARY 15
THROUGH MARCH 3, 2022

This year we commemorate the 25th anniversary of the Benjamin Menschel Fellowship, an award given annually to outstanding Cooper Union students to complete and showcase original projects and research. The works that comprise our 2021 Menschel exhibition confront timely challenges and offer illuminating perspectives on issues of technological, social, and artistic significance. These projects exemplify the caliber and astonishing range of Cooper students' intellectual pursuits that for a quarter of a century have pushed the boundaries of creative research, analysis, and intervention. Throughout that time, the fellowship has been supported by Richard and Ronay Menschel, the Charina Endowment Fund, and the Horace W. Goldsmith Foundation. On behalf of the Menschel Fellows and The Cooper Union, I would like to gratefully acknowledge their commitment and generosity.

—Ninad Pandit, *Director*
Benjamin Menschel Fellowship

25 CELEBRATING 25 YEARS



Pamela Newton, *Editor*
Corinna Ray, *Exhibition Coordinator*

2021 Benjamin

MENSCHEL

Fellowship

EXHIBITION

Above: Annabella Chen, Scarlett Chen, Ahzin Nam; food couriers waiting near a hub of restaurants in SoHo.
Front cover: Kaniz Fatema; Detail, still from intro sequence. Based on photos of Birangonas

CIRCULAR PYROLYSIS

BRANDON BUNT BSE'22 | ELIAS DILLS AR'24
LIONEL GILLIAR-SCHOENENBERGER CE'23

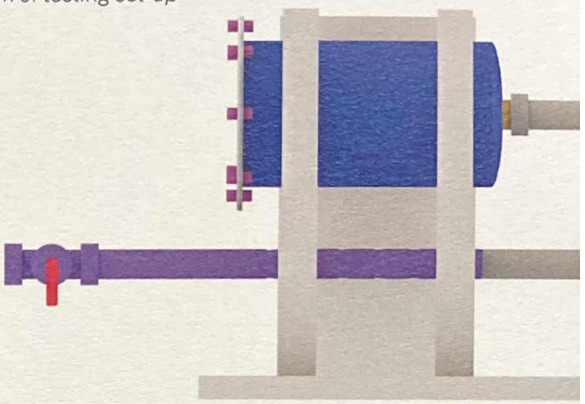
Metropolitan centers and suburban sprawl depend upon efficient sanitation infrastructure to exist and provide a baseline for a good quality of life. As populations grow, so does the amount of waste that needs to be processed. The onset of the Covid-19 pandemic and the proliferation of e-commerce have increased the amount of waste and changed the types of waste being produced. This waste, if not properly processed or transformed, harms the environment through pollution and the emission of greenhouse gases.

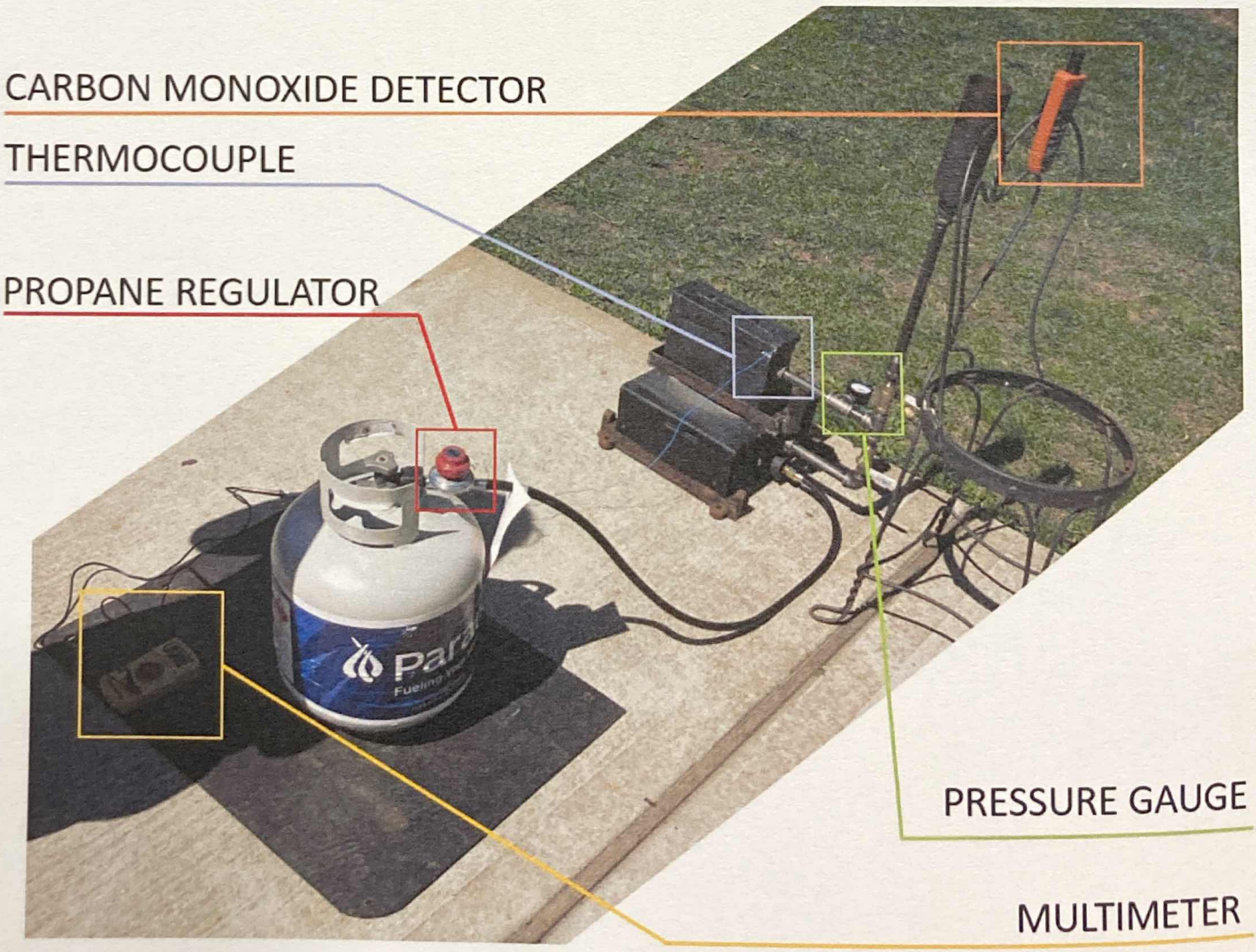
Staggering volumes of cardboard and paper waste are commonplace curbside scenery, oftentimes uncollected for many days, sometimes even weeks. The EPA states that cardboard makes up 23.1% of all municipal solid waste produced in the United States as of 2018, with a minimum of 17 megatons consistently landfill-bound every year since 2010. Although cardboard can be recycled, it can only be reconstituted up to 5-7 times; thus, all cardboard that is ever produced is guaranteed to be carted to a landfill, where it is left to decompose and release greenhouse gases, such as methane and carbon dioxide. Fortunately, this cardboard waste, and its carbon content, can be sequestered through pyrolysis or gasification, resulting in a solid charcoal product called biochar. Since laboratory and industrial (proprietary) systems are currently neither practical nor available to the public, the goal of this project was to design, construct, and test a biochar reactor that fills this gap of inaccessibility and, as a direct result, furthers discourse about reimagining waste reutilization.

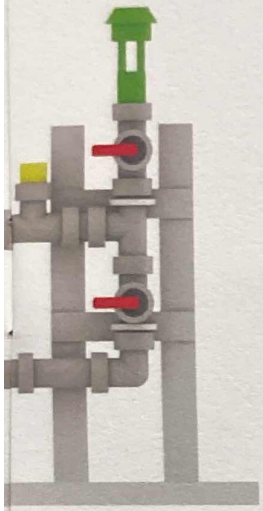
To make biochar, organic material is heated in an oxygen-absent environment, and, as the matter transforms, tar and flammable synthesis gas are produced. The characteristics and quantity of the biochar product depend upon the input material, known as the feedstock, and the rate of heating used to conduct pyrolysis. The process design and biochar reactor system are then tailored to match the heating profile to

Cardboard produced weekly from a single grocery store on Havemeyer Street in Brooklyn, NY

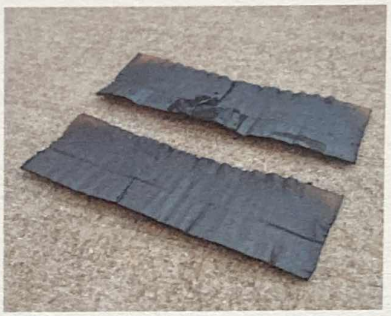
Left: Full view of Reactor V1
Right: 3D render of reactor parts
Below: Diagram of testing set-up







Pyrolyzed roll of toilet paper



Pyrolyzed pieces of cardboard

maximize efficiency. Our biochar reactor utilizes immediate gas recycling to further the heating of its feedstock chamber. The chemical composition of synthesis gas can vary, but all are easily combustible, and so are routed to the fire box as a supplemental heat source. The additional heat furthers the pyrolysis occurring within the feedstock chamber as a cyclic process, acting as an innate energy gain.

The art of making biochar has been used throughout the globe for several thousand years, yet the reason why it is being made has changed. The transition from a time when bio charcoal was used in daily life and made readily to a time when it was forgotten is recollected through human experience. The son of an Italian farmer from Abruzzo, Italy, recounts a story of biochar being made, sold, and used in his home village, until the proliferation of propane heat in the early 1950s. Originally, the biochar was used as a concentrated fuel source, since it retains 80-85% of its original energy content but only weighs 20-30% of the original mass. The charcoal was either placed in a "fornello," a type of concrete basin used as a cooking stove, or put into a "brasciola" (or "coppa"), a square zinc container used to keep warm in winter. Every week, he was sent to buy the lump char with a burlap bag, containing 15 kilos when full. Charcoal sellers were lone men who lived higher in the hills, who would fell trees and brush and make one-car-garage-sized piles. To create the earth kiln, they smothered the large wooden mass with earth, except for a small opening at the top to allow for the escape of air. The pile would be lit and left to smolder for a week under constant monitoring; the mounds could be seen glowing from the valley at night.

Biochar's use as a fuel source declined steadily with the advent of other fossil fuels, and so did much of the knowledge of its production. The desire to reinvigorate this old form of knowledge for a new application of carbon sequestration, and for beneficial use as an additive for enhancing common materials such as concrete or arable earth, has led to this investigation of biochar and the art of its production. ■

BANQUETS TO GO

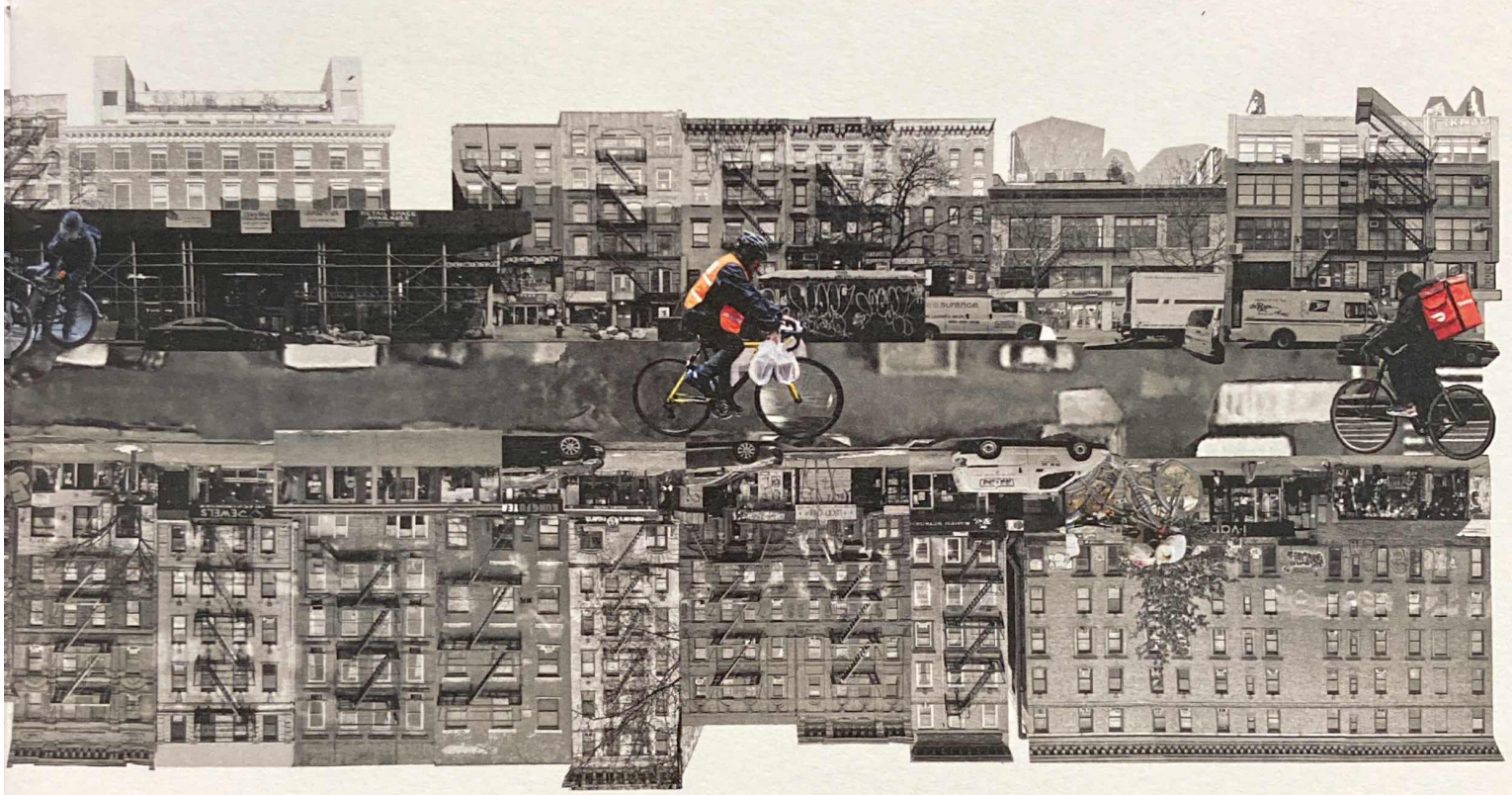
In the wake of COVID-19, restaurants have erected outdoor dining structures as last-minute measures to keep their businesses afloat. As these sheds have emerged and saturated the sidewalks of NYC, they have likewise defined a new streetscape for the city.

While at the outset, these structures were not built to last, nor were they particularly comfortable to use, in less than two years, numerous companies, architecture firms, and local organizations, among others, have begun producing a wide range of outdoor dining sheds, recognizing that this new food-fueled streetscape is here to stay.

Hidden between these densely packed and increasingly luxurious edifices is something less obvious though equally critical to the survival of the city's food industry: a network of food delivery workers. Despite the food delivery market having doubled in the US since the beginning of the pandemic, this transient infrastructure of app-based food couriers is still severely overlooked and unaddressed in the built world.

In studying the rise of outdoor dining structures as a method for reclaiming city streets for pedestrians, our research focuses on repurposing the territory of the

ANNABELLA CHEN AR'22 | SCARLETT CHEN AR'23 | AHZIN NAM AR'22

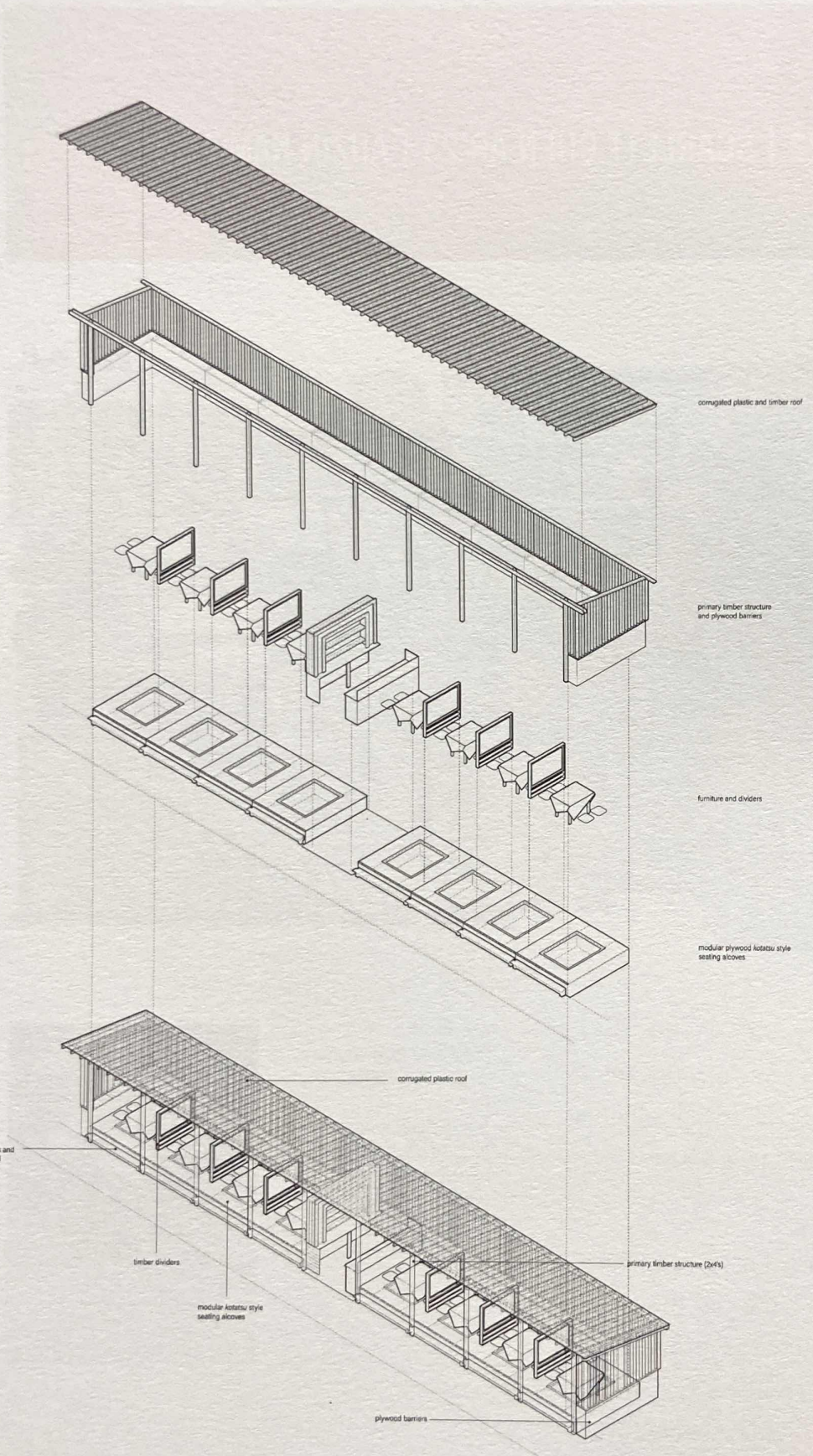


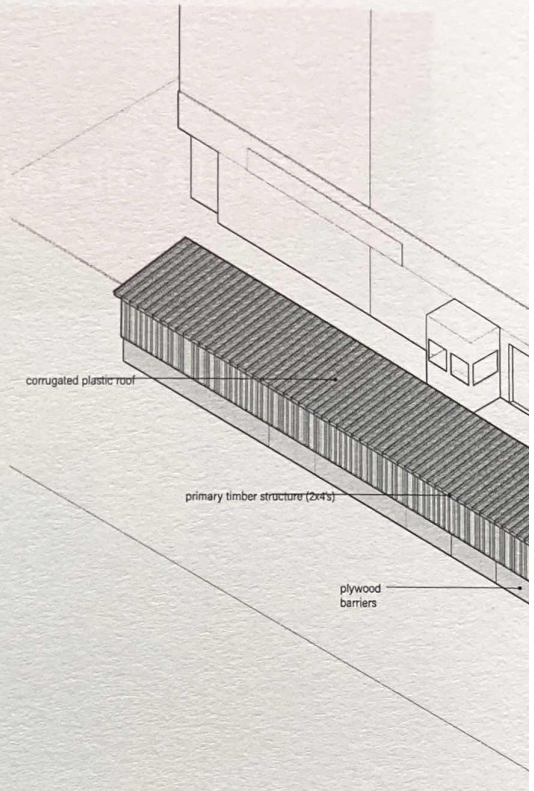
street for the food couriers of NYC. Specifically, this research looks at St. Mark's Place as a site of intervention, a street that has historically been a hub for social gathering, and has remained so, albeit now fueled by a dense occupancy of food establishments.

Through the research of historical street usage and the analysis of outdoor dining structures in the city, this project proposes a prototype for street furniture that prioritizes the safety and comfort of food delivery workers. CNC milling, 3D printing, and standardized construction elements have been used to produce a design that is easily and quickly deployable by local communities.

Above:
Collage of food couriers on St. Mark's Place

Right: Bikes customized by food couriers using plastic crates and mitten attachments


corrugated plastic and timber roof
primary timber structure and plywood barriers
furniture and dividers
modular plywood kotatsu style seating alcoves



Left: Exploded axonometric of kotatsu-inspired outdoor dining structure at Dr. Clark, designed by greenriverproject.

Above: Axonometric of detached outdoor dining structure for Dr. Clark, located in Chinatown.

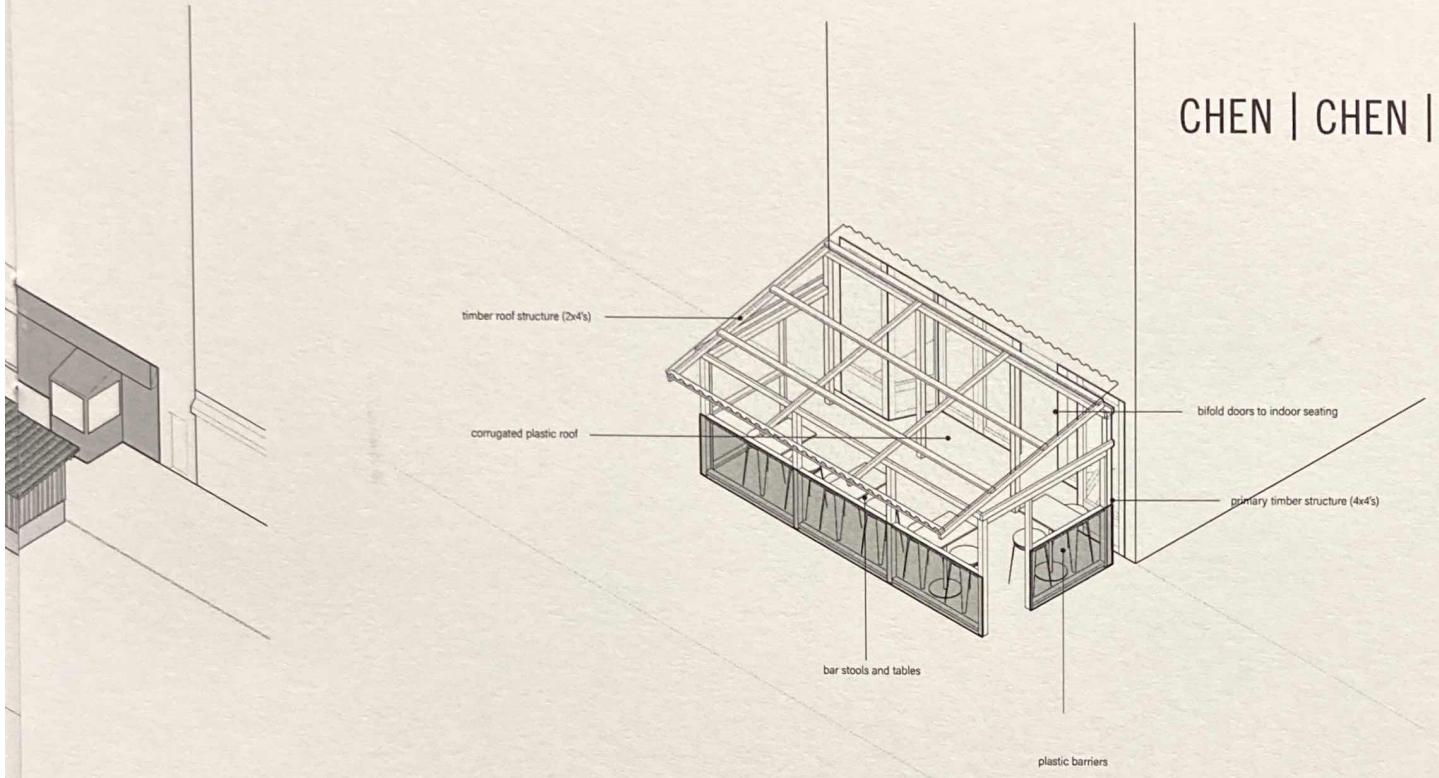
Opposite page

Top: Axonometric of attached outdoor dining structure for the 13th Step, located in the East Village.

Bottom left: Axonometric of canopy outdoor dining structure for Uluh, located in the East Village.

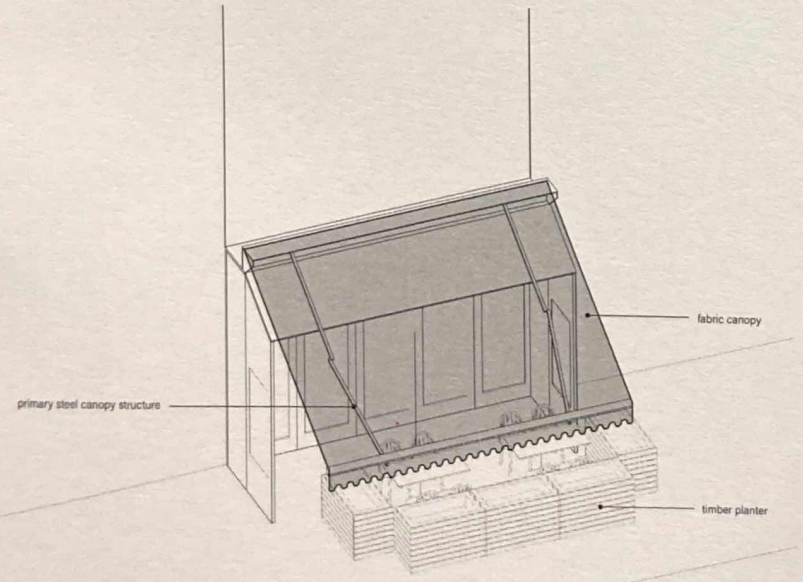
Bottom right: Axonometric of Re-Ply outdoor dining structure for Nami Nori, located in the West Village.

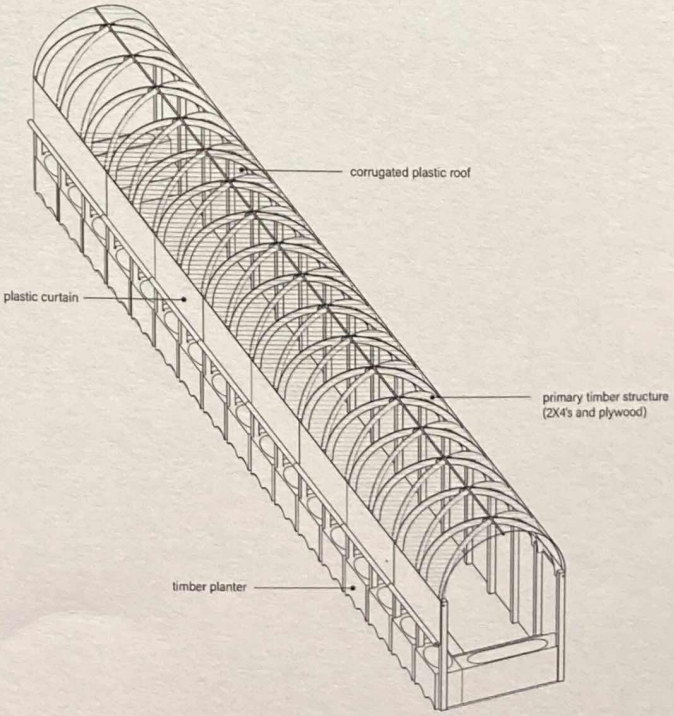
CHEN | CHEN | NAM



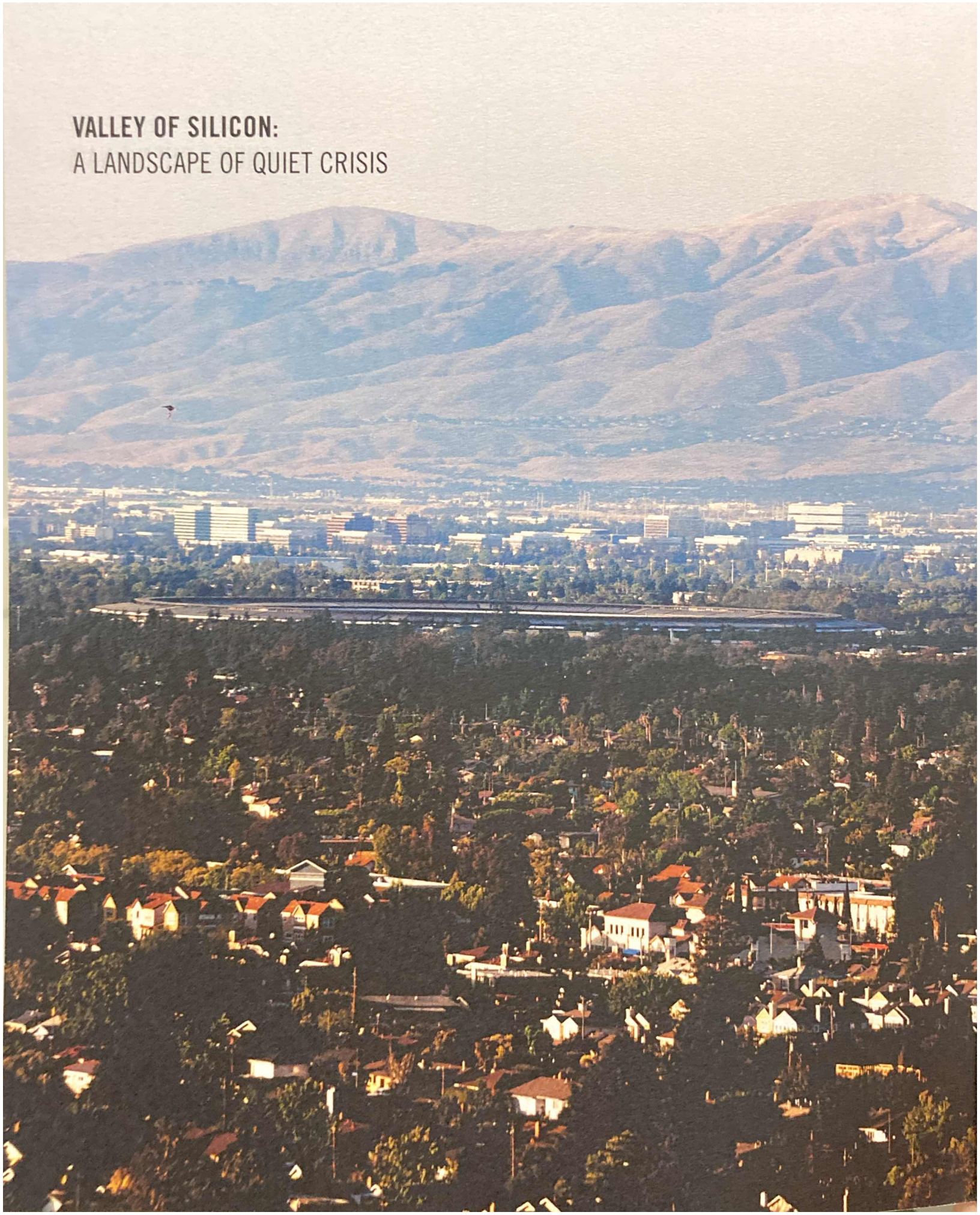
"For delivery workers, the workplace comprises the city streets, the restaurants where they pick up food, customers' front doors, and building lobbies and elevators... Despite being deemed essential during the pandemic, NYC food couriers remain unprotected."

— Los Deliveristas/ Worker's Justice Project, "Essential but Unprotected"





VALLEY OF SILICON:
A LANDSCAPE OF QUIET CRISIS

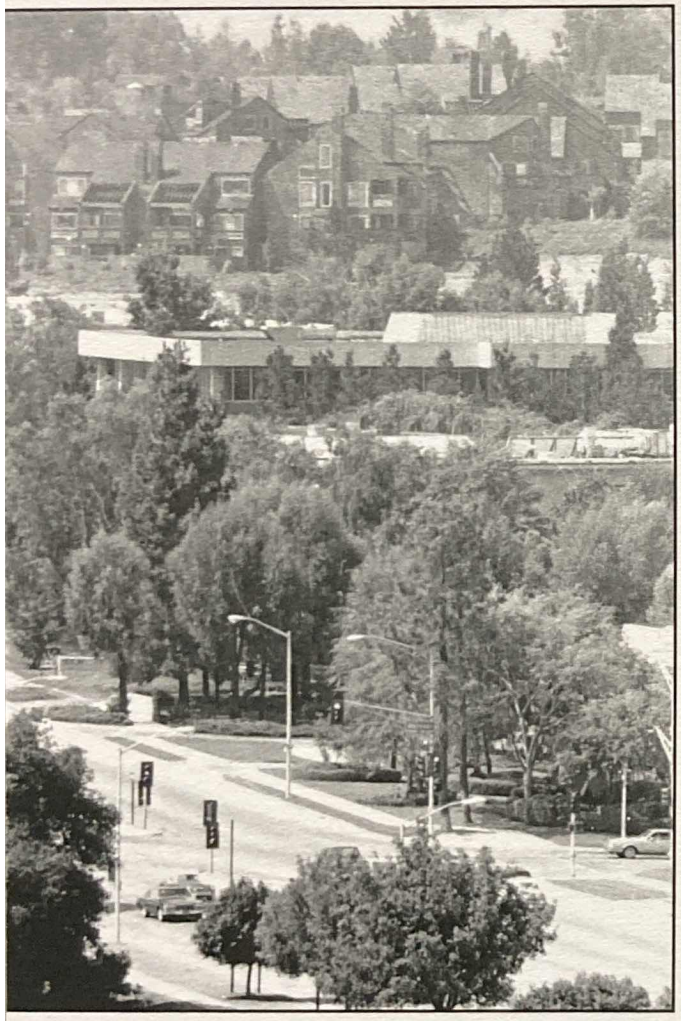


KEVIN CHOW AR'22 | CHAU-ANH NGUYEN AR'23 | VIRGINIA REBOLI A'22

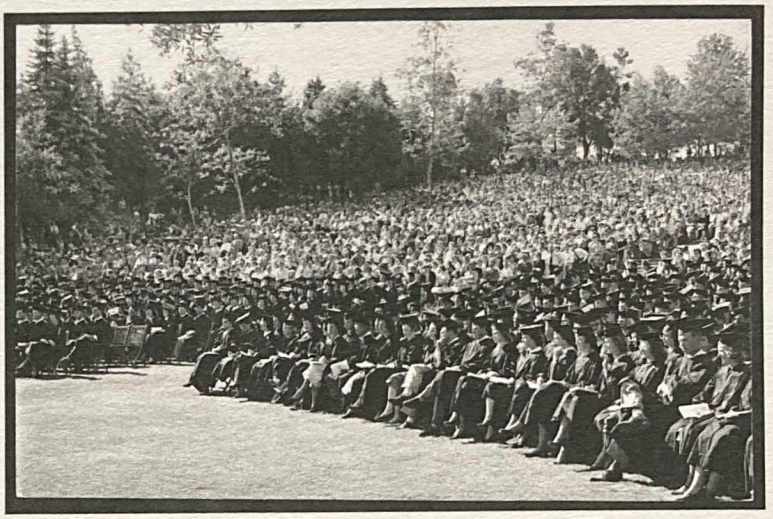
There is a legend told thusly:

> The history of the Valley, the seat of power for High Technology, began with the quiet initiation of the Order of the White Collar. The Order was an invention by a bureaucrat, of all people—a man named Frederick Terman—who had been roused by the fear of crisis to realize a cunning born from desperation. His university, though plentiful in acreage, was quickly becoming impoverished, but in the wake of the Second World War, he saw a chance for profit and power. Seeking the wealth sure to come from the simultaneous ends of technological advancement and warmaking, he created a new class of people, fostered on the grounds of the university.
>
> Terman, with his grand vision, declared:
>
> "This will be the birthplace for a new class of people. You are not laborers, but thinkers, who have wandered beyond the boundaries of the academy into a dangerous world which now wages a war of technology. But you are not to think of war. You are to ruminate on beauty. Within this campus or this park, you will marvel at the beauty of our crafted Nature while you fashion the cruelest, most unnatural technologies.
>
> "And while you dirty your hands, you will keep the collars of your shirts the purest white. Under the veil of beauty, with your cruelty shielded and justified, you will now be known as the Order of the White Collar."
>
> Beautiful, the land flourished.

From Fremont Older Open Space Preserve, a county park of the Santa Clara Valley on the suburban fringe, the quiet residential community of Saratoga makes up the foreground, with Cupertino, then San Jose farther away; towards the left would be San Francisco. In view is a sliver of Apple Park—the monolithic headquarters of Apple Inc.

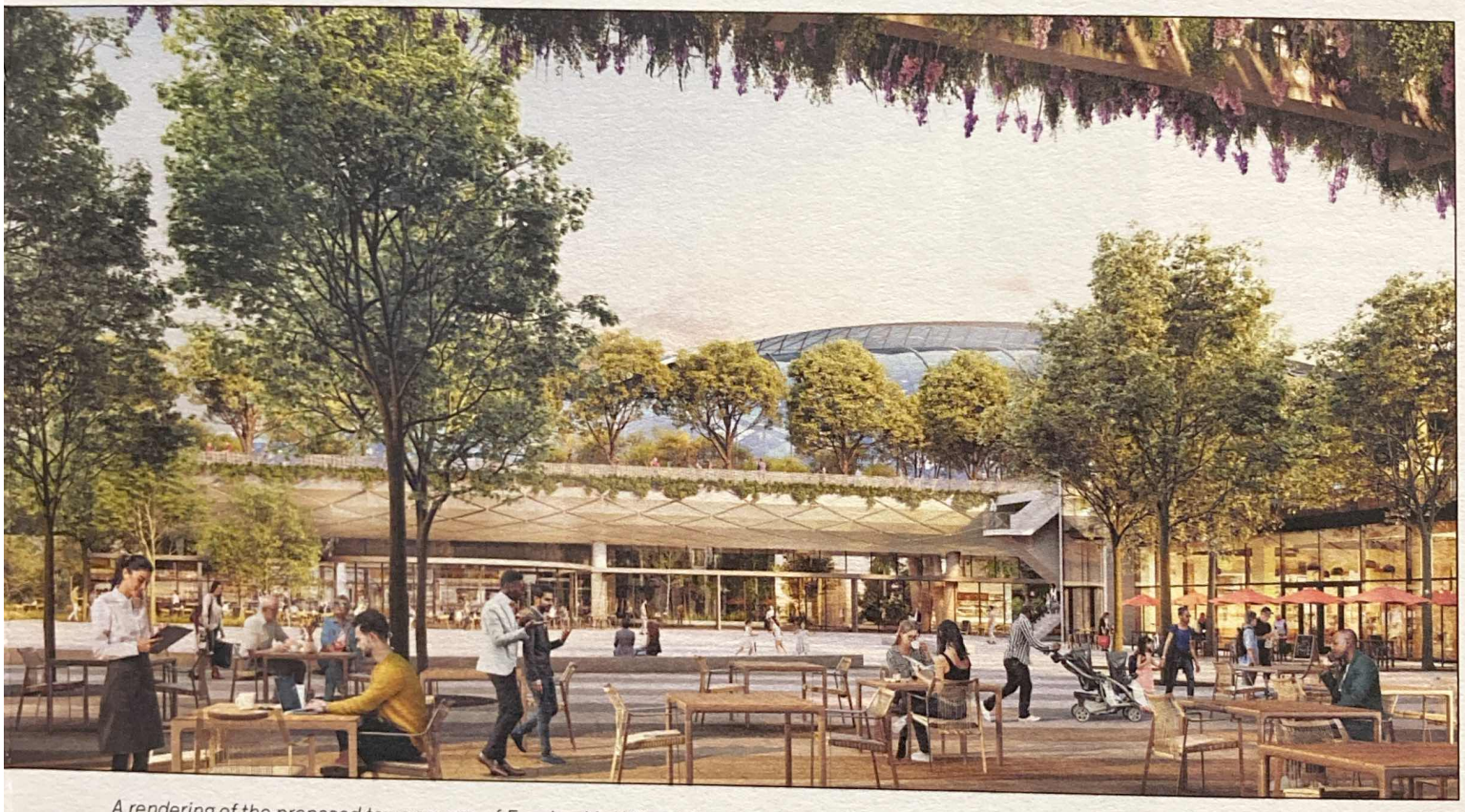


In 1951, 209 acres were allocated for Stanford Research Park, an R&D-focused business park that would generate income for Stanford. The university's graduates would be the perfect new hires.



Top: Stanford commencement

Bottom: The new hires, at work: at the Whisman Road assembly area for Fairchild Semiconductor



A rendering of the proposed town square of Facebook's Willow Village neighborhood. In the background is a glass dome; surrounding is an elevated park. Tech workers of today sit in an open, yet enclosed area. They work leisurely in the landscape provided by their employ—Facebook—one of the world's largest tech giants.

In this exhibition, we will disassemble this beauty, and, ultimately, this legend. In doing so, we will reveal the evil machinations behind the Valley's legend-making, including the lecherous alliance between high technology and war, as well as its unprecedented destruction of the earth. We will examine the long tradition of the reverence of nature through labor on the land, and the ways in which these values were distilled into the technology campus. We will discuss legendary figures and their decrees upon the Valley. In these ways, we will talk about beauty.

The tools will be mythos and film. Myth, or the beautiful half-truth, will help us understand the content of seemingly agnostic imagery. Ranging from phenomenal projections that color the room to didactic sequences that bash disparate subjects together, these videos present a vision for a new myth of the Valley. ■

BIRANGONA: WOMEN OF WAR

Drawings featured in animation, based on photos of birangonas

KANIZ FATEMA A'22

It was in my backyard in D.C. where the seeds of this project were sown. It was mid-December, and I was listening to Kishore Kumar's *"Ek Din Pakhi Ure Jabe,"* sitting on a swing, letting the song play openly in the crisp air. The song itself comforted me—it was a familiar tune that I heard in the car when my parents would drag me to the bazaar and flea markets for a tedious day of shopping around the DMV area (D.C, Maryland, Virgnia). It's a very old song, one that existed before Bangladesh, but it feels cinematic to me. Kishore Kumar's voice sings a lighthearted melody, whose lyrics I spent years with my so-so Bengali trying to decipher. The iconic line, *"Ek din pakhi ure, jabe je akashe"* (One day a bird will fly away in the sky), held a world of possibilities for me. Listening to the lyrics, I knew that, literally, he was speaking of a bird, but in my mind I saw a woman. The song for me became about a woman who has to leave home, never to return again. She is pained and shrouded by thunderclouds and rain. Birds *(pakhi)*, thunder *(jor)*, and rain *(brishti)*, are feminine words to me, mainly because their images have been described to me by female storytellers.

That night on the swing I began seeing wisps of a woman yearning for freedom, and after a couple of intent listens, the outline of a narrative took shape. To me, the song sounded yellow, or manila. I began thinking of aged paper and mustard fields. And from there, the image library in my head began to produce dust, bicycles, dirt paths and ponds, green trees, humid air, and white cotton clothing. Maybe I was yearning to visit the homeland again, which I hadn't in 16 years, or maybe I was envisioning a setting for my heroine. However, this setting was before my time, these images were my nani's—my grandmother's: romanticized, old, but filled with stories of everyday people. For me, this story had to take place during the Bangladeshi Liberation War of 1971.

I have always known that I wanted to make a short animated film before I left Cooper. Though animation is central to the project, the art of animation was only a conduit for storytelling. This project, *Birangona: Women of War,* is a type of story that I have yet to see through the lens of animation. However, the images and visual poetry that I experienced while thinking of the subject were too strong to be left in my imagination.

At the beginning of my research, I was not exposed to much art or content related to the war of 1971. And what I was exposed to had heavy themes of nationalism and the formation of a nation. I recall images of strong women wearing white *saris* and *bindis*, carrying rifles, determined to give themselves to the freedom movement. However, I wanted to

recall the image of a woman in 1971 that made me think of women like my nani, who were simply trying to survive.

I've been making attempts to connect with my identity as a Bengali woman and as a Bangladeshi woman. Throughout my time at Cooper and continuing still, I've been trying to piece together Bengali feminine identity through art, music, and popular culture. Regardless of who or what I find, 1971 looms darkly over my perception of Bengali womanhood.

The Bangladeshi Liberation war was fought between Pakistan and East Pakistan, now Bangladesh. Reasons for the separation consisted primarily of differences in ethnic identity, language, religion, and politics. To put an end to the Bangladeshi nationalist movements, the Pakistani government issued Operation Searchlight. The intent was to eliminate Bangladeshi nationalists, but the operation also initiated the Bengali genocide. This operation granted systematic killing and the systematic rape of Bengali women. Up to 200,000 women in Bangladesh were subjected to sexual assault. Post-liberation, the Bangladeshi government nationally recognized victims of rape. The first president of Bangladesh and leader of the Freedom Movement, Sheikh Mujibur Rahman, honored these women with the title *birangona*, meaning war heroine. However, the continued stigma around rape has concealed women and subjected them to

social isolation, poverty, and additional trauma. It did not help matters that *birangona* was similar to *barangona*, meaning prostitute.

Initially, I thought there would be very little content centered around this subject on which to base my research. I planned to make a narrative about a *birangona* who cannot return home but still continues to live and finds ways to heal. The story was to be animated in the illustrative style of Studio Ghibli, and complete with a beginning, middle, and end. It would be a fictional narrative, but the voiceovers in the film would be a collection of multiple *birangonas* sharing snippets of their lives (or experiences). Recording the spoken word was crucial to the film; I needed to find interviewees and develop interview questions. Finding *birangonas* was going to be difficult in New York City, considering also that I was not connected to the Bengali community here. So I sought to connect with Bengali women's organizations and scholars as an avenue to be in communication with *birangonas*. I was fortunate enough to connect with Professor Dina Siddiqi after her Webinar for NYU, "War, Violence and Memory: Commemorating 50 Years of the 1971 Bangladesh War." I was also fortunate enough to be connected to Naripokkho, a women's activist organization in Bangladesh that works extensively with *birangonas*. After these meetings, I learned that there was a lot of coverage on *birangonas*, though not all interviews were ethically conducted. Given my constraints with time and travel, the team at Naripokkho and Professor Siddiqi advised me to look into written works, where the authors had already conducted their interviews with care.

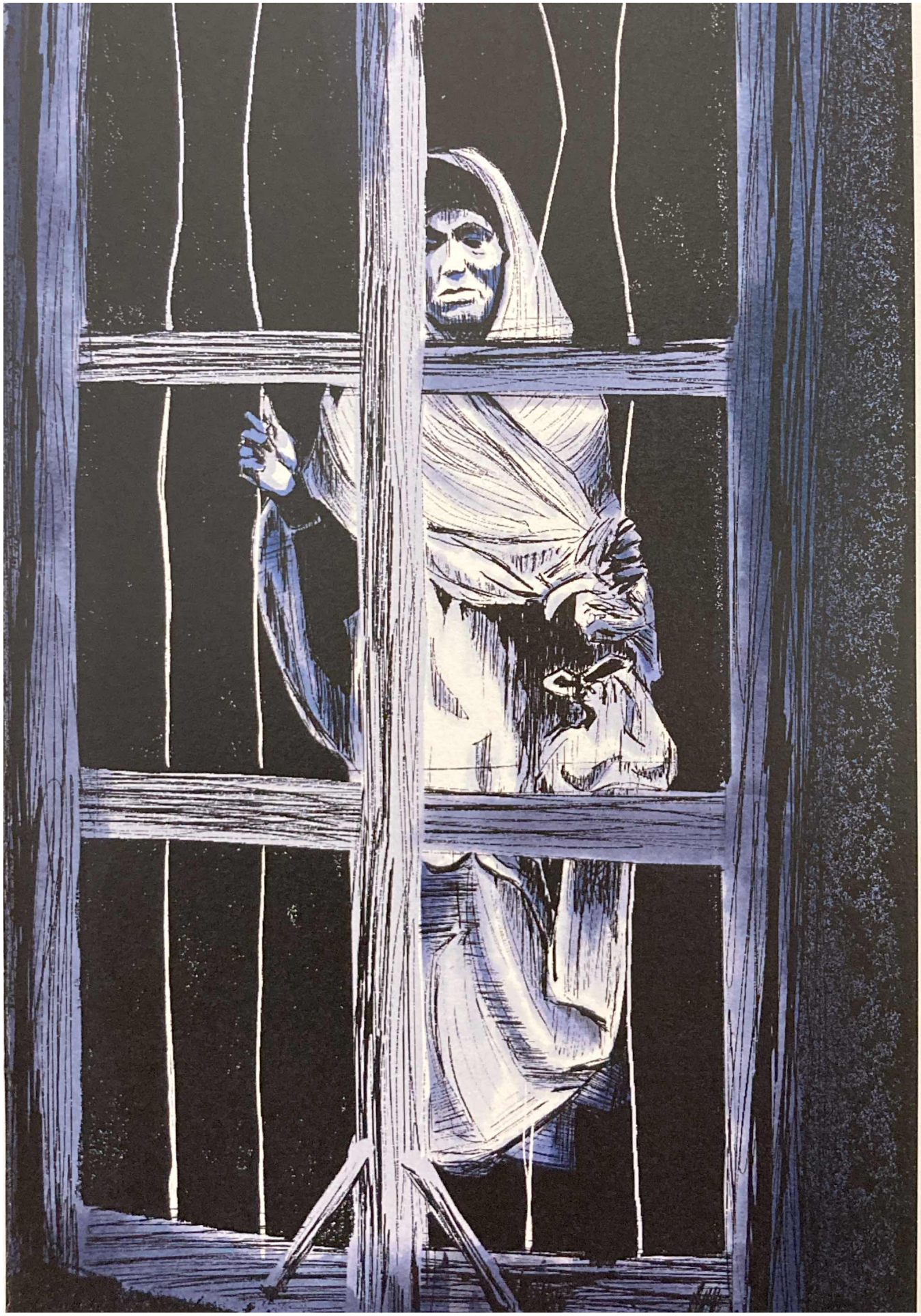
The two texts I have relied on are Yasmin Saikia's "Women, War, and the Making of Bangladesh: Remembering 1971" and Nayonika Mookherjee's "The Spectral Wound." Going through these texts, I noted what intrigued me through the thread of stories I read. Words that stood out were "covering" and "combing." There were multiple mentions of clothing, particularly the sari. I began exploring the sari as a motif and dichotomy: an object that hides, conceals, covers, and silences, but also an object that adorns, frames, and dignifies. How women are clothed remains a controversial topic to this day. What matters, however, is who is putting on the clothes. A sari put on a *birangona* serves to conceal the body and the face of a *birangona*—and silence her. It becomes restrictive and layered, and with each layer she becomes less visible. A sari put on by a *birangona*, however, serves to protect her, shield her thoughts and the tenderness of her soul from those who decide to exploit it. The sari that a *birangona* wears is her autonomy, her way of framing and presenting herself.

Early concept art

The conflicts *birangonas* face go beyond "Pakistani vs. Bengali." *Birangonas* didn't just include Bengali women but also the Bihari refugees who were persecuted by Bengalis during the liberation movement. Most of the stories told by *birangonas* go into depth about their lives after the war and interpersonal interactions with family and members of their community. Though every story was told separately, miles apart in different regions of Bangladesh, it felt as if some women were talking to each other, sometimes in agreement and at other times in conflict. When I read "women were like cattle," the phrase rippled throughout the stories, connecting these women. When I read of the tenderness and concern women had for their mothers, it was as if they all shared the same mother. The desperation of one *birangona* to be heard was juxtaposed with the silence of another.

I felt like I found a thread that tied these storytellers together. I decided that I would assemble these quotes without altering the text to make a nonlinear narrative and that the film would be centered around portraiture. Though my project changed in its focus, I still am determined to keep the medium of this project rooted in animation. Animation is an excellent medium for narrative and for creating empathy on the part of the viewer for a character. I believe animation can both unite and individualize survivors by making them worthy of art, production, and an audience.

I hope to finish this film by my graduation, and what you see exhibited in this gallery is my progress. ■



FATEMA

TALYA KRUPNICK A'22

When I started this project, I was in a crisis of meaning. My life had become unimaginably impacted by loss. What became useful was assigning significance to the invisible remnants of my relationships, to sustain a level of emotional intensity in my life. I found a way forward through leaps of optimism, poorly built logic, and magical thinking. I began to cherish ideals of universalism, and, even moreso, a concept of clarity—pure communication and bliss. The location of this project had to be beyond language, and, instead, lie in experience.

In a film I saw, at the height of their conflict, two people sit resigned on an endless white plane. The circumstances that have brought them here are impossible; the task that brought them here is unachievable. The environment is completely desolate. The characters are at an impasse. They are stuck in a place without proper events, a code of conduct, anything to base their actions on. I knew I had to go there.

The ability to extrapolate significance from anything is one very messily tied to this project. At the beginning, this ability motivated me in a very naive way. I saw the countless connections I was making as proof of some grander illumination, as if there was some grounding for my ineffable beliefs. Soon, though, I began to understand this as a further function of a perceptual proclivity that we have. I understood that the value judgments I was making—casting the environment as pure, blissful, serene—had very little basis in reality...nor did opposing ideals of desolation, either. In both directions, these descriptors are very flimsy and transparent. Still, as I began to realize this, I could not cast aside the usefulness of the procedural structure they created, nor the emotional realness that my original insistence on meaning had brought me. I wanted to untangle the knot, to insist that my original beliefs could still be true, not contrary to my own perceptual biases and limitations—but as a result of them.

Going into the project, I hypothesized that the salt flats would serve as an isolating force, severing things from their contexts, signifiers, and, somehow, simplifying them. I thought that in these conditions, things like time and space would become visually apparent, nearly obvious. But with experience, and

Northrup Grumman campus front lawn

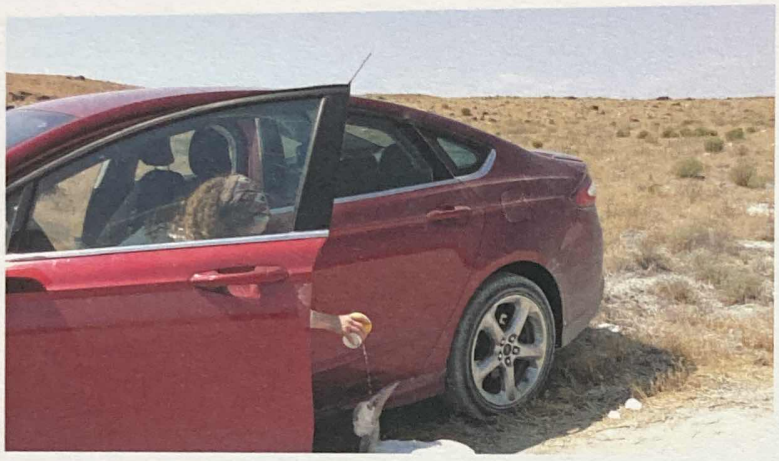
a closer attention to this condition, I understand that my hypothesis could never be the case. Now, I understand that the salt flats are a sort of mirror. They reflect *whatever*—context, signification, and meaning are things we carry with us, to remote extremes, past usefulness and logic. And the salt flats themselves are not free of their own surroundings and locality. They are nested within a sprawl that is dependent on them, where each industry has its own complex relationship with the site. These connections are so rich that writing my initial essay for narration seemed effortless—it became a game of reading, where endless combinations could be paired for infinite meaning.

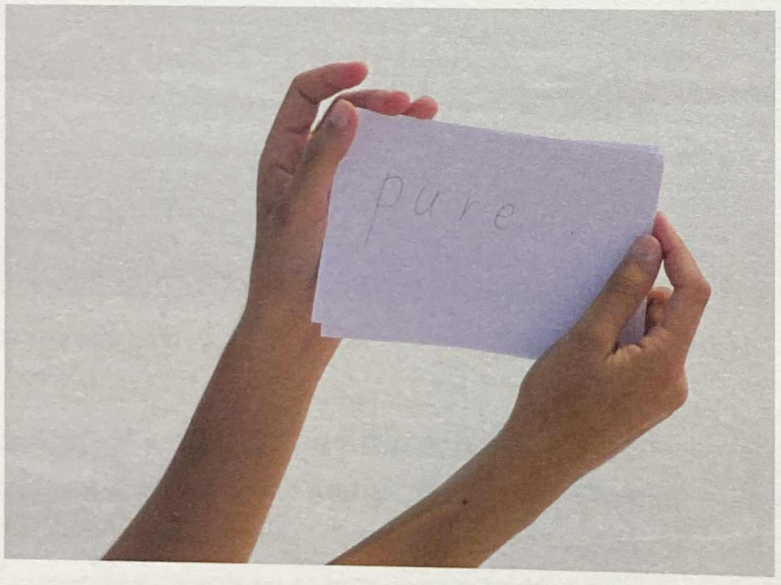
When there is so much meaning, when every thought becomes worthy of extensive interpretation and examination, the meaning becomes more important than the subject. The subject begins to lose to its own extrapolations and unwindings. To bring back definition to the original focus, you have to begin to look for its edges. A moment of clarity, a meaningful encounter, a beautiful view, are heightened experiences, in part, because of their temporality. I know what is meaningful, because I have experienced something that is not. This ongoing evaluation is captive in some type of longer timeline. I've heard about people who try to throw themselves into an object in their surroundings, to

try to be it for a moment, a mindfulness practice for building awareness and connection to the world around them. I can pretend, for a moment, with a tree, but I don't think I could ever achieve an understanding with a mountain.

A landscape, a bigger picture, a step back. A recognition of the time that's passing, clarity, simplification. A lie. a truth. A lie that tells the truth. A projection. A way of thinking. A way of not thinking. I think I approached the project as if I was asking a question and imagined an answer that would be, yes, complex, but also straightforward, or bold. However, the strongest thing evoked by this landscape, these conditions, is a sense of wonder. And while a condition of awe can be overwhelming, it is more related to a subtler attention. It is only attention that puts something new or impressive before our eyes, that permits us the experience of wonder. It's a level of care, where perceptual anomalies are not mistranslations. When experience becomes estranged from us, when it is no longer the formative force in our lives, being an active witness becomes all the more important.

In a much earlier iteration of this project, I used information from a research paper by Eva Wong and Naomi Weisstein called "The Effects of Flicker on





Empathy has little power against the extreme summer heat, Great Salt Lake

Below left: Still from video

the Perception of Figure and Ground," with the hopes that rouletting footage at a certain hertz rate would achieve a visual confusion as described in the paper I had read. The AV department went to unimaginable lengths to make working in this way available to me, through a script they had programmed, and I began to shuffle 31 hours of footage in this way. Still, when I watched the footage of my compiled videos spliced together at 4-second intervals, I didn't feel engaged as I knew I should. I began to try my own frame-by-frame editing, trying to trigger a more involved viewership. The more I started to achieve this, the more my writing started to fall apart, but that's when I knew something was working, so I started to lean in. I rerecorded my narration, parts without a script, trying to address this failure, this collapsing structure, and to make it real.

In the end, I'm certain that my project is not what I set out to make, which is why I'm so deeply grateful. I have learned so much along the way, and I am wholly appreciative of the dedicated channel for growth this project was able to provide me with. I'm happy to know my ambitions and abilities take me far, but I'm more touched by the endless support I received in realizing this project. Thank you. ■

KRUPNICK

2021 Benjamin
MENSCHEL
Fellowship
EXHIBITION

CELEBRATING 25 YEARS

The Benjamin Menschel Fellowship Program to support creative inquiry was endowed by a grant given to The Cooper Union by the Horace W. Goldsmith Foundation to support work in the fields of art, architecture, design, and engineering. This generous grant was intended to provide funding to exceptional students who propose scholarly, independent projects that will in some way provide a culmination to their educational endeavors at The Cooper Union. It is the hope of the Goldsmith Foundation that students designated as Menschel Fellows will be encouraged by their awards to complete bodies of artwork, develop scientific protocols, or otherwise further their intellectual investigations in a manner that will provide inspiration and illumination to the community as a whole.

Kevin Chow, Chau-Anh Nguyen, Virginia Reboli
Apple Park in bird's-eye view.
Historically, silicon chip manufacturing has been seen as one of the cleanest industries. This is false. The Santa Clara Valley has 23 active Superfund sites, EPA-designated untreated contamination areas.

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